Math 2534 Homework 1 (sec 2.1) Spring 2018 Name_____

Put all work on another sheet of paper. Follow the Homework Requirements found on my website and **use only the notation used in class. Staple multiple sheets.**
Please print off this sheet and bring it to class for in class work.

Problem 1: Given the propositions:
P: Mary is in CS is a true statement
Q: John is an Engineer is a false statement
R: Grace is a Math Major is a true statement

Determine the truth values of the following compound propositions; Show your work in detail using correct notation.

1) $(P \wedge \sim R) \vee \sim (P \wedge Q)$
2) $(P \oplus Q) \wedge \sim R$

Problem 2:
Let p, q and r be the propositions given below:
p: The birdwatchers are in the woods.
q: A blue heron was seen at the lake.
r: Migration starts soon.

Part A:
Put the sentences below into symbolic logic notation.
a) No blue heron was seen at the lake, but the birdwatchers are in the woods.
b) It is not true that migration will not start soon.
c) Migration starts soon or a blue heron is seen at the lake.
d) Either the birdwatchers are in the woods or migration has not started soon.

Part B:
Put the symbolic logic notation into English sentences.
a) $(p \wedge q) \vee \sim p$
b) $\sim (p \vee r) \wedge q$
c) $(p \oplus \sim q) \wedge \sim q$

Problem 3: For each of the sentences below, determine whether an 'exclusive or' or an 'inclusive or' is intended.

1) To go the game cheerleaders can go either by bus with the band or by air with the team.
2) The next question is true or false.
3) You can help clean the kitchen or the bathroom.
4) You may either go to the retirement party or the play which are each at 8 – 10 pm tonight.
5) The Girl Scouts can sell cookies door to door or hold a cookie booth at Kroger's.

Problem 4:
Construct a truth table to verify the following equivalence relations and use sentences to explain results.

1) $\sim (p \wedge \sim q) \vee (\sim q) \equiv \ \sim p$

2) De Morgan's Law $\sim (p \vee q) \equiv \ \sim p \wedge \sim q$

Problem 5:
Logic Puzzle:
Solve the following puzzle and then write up a paragraph explaining your reasoning. Use your own judgment on how to write this up. It needs to be clear to anyone who tries to follow your write up. Do not use tables or charts in your presentation. **Write a final summary for your conclusion.**

The Spelling contest:
There were five finalist at the Blacksburg Middle School Spelling Bee. They competed till four of the five had misspelled a word and the last student was declared the winner. Given the following statements below (**one of which is false**), find the first and last name of each of the finalist where surnames are given to be Snider, Johnson, Owens, Keener, or Murphy. Determine who missed which word and what was the order in which they finished the competition.

STATEMENTS:

1) Owens, who was not the one who misspelled "pneumonia" had not participated in a Spelling Bee before He said he had not expected to do well.
2) "Vicissitude" was misspelled immediately after "bivouac" and immediately before "isthmus".
3) Eleanor was happy that her good friend Snider was one of the two finalist in the contest.
4) Before Eric misspelled his word there were only two contestants left. He and Keener had studied together to prepare for the Spelling Bee.
5) Max, who lasted longer in the competition than Snider was not the winner.
6) Johnson, who is not Anna, was the first to misspell a word.
7) Anna, Snider, and Keener were neighbors.
8) Snider told Louise that she could not sleep the night before the contest.

This part will be done in class: **Student Grader Name**_____

Assign a grade as follows:
Part 1: Read the student's write up carefully and assign the "write up" points from 1 to 5 according to your subjective assessment of its clarity. (**Points**:_____)

Part 2: The summary is worth 5 points if correct and 3 points if incorrect and 0 points if no summary is given. (**Points** :_____)